This listing of claims will replace all prior versions and listings of claims in this application:

Listing of Claims

1. (Currently amended) A method for fabricating a compound optic for short wavelength radiation, the method comprising:

removing material of a substrate to form a surface profile of a first optical element of the compound optic;

thinning the substrate on a side of the substrate opposite the surface profile to form an optical port on a backside of the substrate; and

forming a zone plate lens of the compound optic on the substrate in the optical port.

2. (withdrawn) A method as claimed in claim 1, wherein the step of removing the material comprises applying a tool tip of a turning machine to the substrate to mechanically remove the material.

3. (withdrawn) A method as claimed in claim 1, wherein the step of removing the material comprises directing a beam at the substrate.

4. (withdrawn) A method as claimed in claim 3, further comprising forming calibration features in the substrate.

5. (withdrawn) A method as claimed in claim 4, further comprising forming the calibration features by electron beam lithography.

6. (withdrawn) A method as claimed in claim 4, wherein the calibration features comprise linear scales in the plane of the first optical element.

7. (withdrawn) A method as claimed in claim 4, wherein the calibration features comprise trenches extending into the substrate.

8. (withdrawn) A method as claimed in claim 4, further comprising forming trench calibration features in the substrate prior to the step of directing the beam at the substrate.

9. (withdrawn) A method as claimed in claim 8, wherein the trenches are formed by lithography.

10. (withdrawn) A method as claimed in claim 8, wherein the trenches set the desired step profile for the first optical element.

11. (withdrawn) A method as claimed in claim 3, wherein the step of directing a beam comprises directing a laser beam at the substrate to ablate the material.

12. (withdrawn) A method as claimed in claim 3, wherein the step of directing a beam comprises directing an electron beam at the substrate to ablate the material.

13. (withdrawn) A method as claimed in claim 3, wherein the step of directing a beam comprises directing an ion beam at the substrate to ablate the material.

14. (withdrawn) A method as claimed in claim 3, wherein the step of directing a beam comprises directing a plasma beam at the substrate to ablate the material.

15. (Cancelled)

16. (Cancelled)

17. (Cancelled)

18. (withdrawn) A method as claimed in claim 1, wherein the step of removing the material comprises etching into the substrate through a patterned resist layer to transfer a pattern of the resist layer into the substrate.

19. (withdrawn) A method as claimed in claim 1, wherein the step of removing the material comprises selectively reacting a surface of the substrate to remove the material.

20. (withdrawn) A method as claimed in claim 19, wherein the step of selectively reacting the surface comprises directing a laser beam at the surface through a chlorine atmosphere.

21. (Currently amended) A method for fabricating a compound optic for short wavelength radiation, the method comprising:

forming a surface profile of a first optical element of the compound optic on a substrate;

forming a fiducial mark on the substrate; and

forming a second optical element of the compound optic by reference to the fiducial mark; and

thinning the substrate on a side of the substrate opposite the surface profile to form an optical port on a backside of the substrate.

22. (Cancelled)

23. (Currently amended) A method as claimed in claim ~~22~~ 21, wherein the step of forming the second optical element comprises forming the second optical element in the optical port.

24. (original) A method as claimed in claim 21, wherein the step of forming the second optical element comprises forming a zone plate lens.

25. (cancelled)

26. (cancelled)

27. (cancelled)

28. (cancelled)

29. (cancelled)

30. (cancelled)

31. (previously presented) A method as claimed in claim 1, further comprising
forming a fiducial mark on the substrate; and
forming the zone plate lens of the compound optic by reference to the fiducial mark.

32. (Cancelled)

33. (Cancelled)

34. (Cancelled)

35. (previously presented) A method as claimed in claim 23, wherein the step of forming the second optical element comprises forming a zone plate lens.

36. (Cancelled)

37. (Currently amended) A method as claimed in claim ~~36~~ 21, wherein the step of forming the second optical element comprises forming the second optical element in the optical port.

38. (Currently amended) A method as claimed in claim ~~36~~ 21, wherein the step of forming the second optical element comprises forming a zone plate lens in the optical port.

39. (previously presented) A method as claimed in claim 38, wherein the first optical element is a refractive optical element.

40. (previously presented) A method as claimed in claim 38, wherein the first optical element is a refractive Fresnel optical element.

41. (previously presented) A method as claimed in claim 1, wherein the first optical element is a refractive optical element.

42. (currently amended) A method as claimed in claim 1, ~~Wherein~~ wherein the first optical element is a refractive Fresnel optical element.